

REMARKS

The Rejection of Claims 1, 4, 7, 14, 15, 17, and 18

Claims 1, 4, 7, 14, 15, 17, and 18 are rejected as obvious over the combination of Corazza (U.S. Pub. 2003/0133409) and Sintonen (U.S. Pub. 2003/0142678). The claims at issue, including independent claims 1 and 14, are directed to adjusting the transmit power headroom threshold of a mobile station based on reverse link load indications.

The Patent Office concedes that Corazza does not teach adjusting a power headroom threshold at a mobile station based on such a load indication. However, the Patent Office states that Sintonen “teaches adjusting a power headroom level based upon interference against a received signal at a mobile station.” (Office Action at line 1, p. 3.) Respectfully, that statement is in error.

Sintonen does not teach adjusting the transmit power headroom threshold of a mobile station based on a reverse link load indication, or any other indication. Instead, Sintonen teaches “adjusting the headroom for a received signal in a radio receiver when the received signal includes a target signal and an interference signal.” Sintonen, Abstract.

The “headroom” at issue in Sintonen is the headroom of an analog-to-digital converter (ADC) used in received signal digitization. That is why Sintonen is entitled, “Interference Dependent ADC Headroom Adjustment.” And that is why Sintonen’s Field of Invention states that Sintonen is specifically directed to “...dynamically adjusting analog-to-digital converter headroom of radio receivers.” Lines 10-11 in paragraph [0008] in Sintonen define headroom as the “safety margin” between the input signal level and the maximum level of an ADC.

Further, Fig. 3A and paragraph [0030] in Sintonen teach maintaining an 8 dB headroom at the ADC, for cases where the target (desired) signal is greater in magnitude than the interference signal. Correspondingly, Fig. 3B and paragraph [0031] in Sintonen teach reducing the ADC headroom when the magnitude of the interference signal is greater than that of the

target signal. The ADC headroom is reduced in this case so that more of the ADC's conversion range can be used for converting the target signal.

From these plain teachings it is clear that Sintonen does not teach or suggest adjusting the transmit power headroom threshold of a mobile station, much less doing so in response to reverse link load indications. Because that limitation is missing from Sintonen, and because that limitation is not taught or suggested by Corazza, the Patent Office has failed to establish a *prima facie* case for obviousness against claims 1, 4, 7, 14, 15, 17, and 18. Applicant therefore respectfully requests that all such rejections be withdrawn.

Applicant also submits that the Patent Office's characterization of Sintonen with respect to the claim limitations at issue has further errors. For example, the rejection argument appears to improperly liken received signal interference levels in Sintonen with the reverse link load indications at issue in the claims. For example, the first paragraph on p. 3 of the Office Action states:

Sintonen teaches adjusting a power headroom level based upon interference against a signal received at the mobile station. The interference that a mobile would experience is tied into the amount of load that is occurring over a link. The higher the load the higher the interference from the other mobile stations on the same link. Therefore the amount of interference which can be based off the load indication that is sent from the base station will have a direct effect on the power headroom of the mobile station. Sintonen teaches maintaining a certain power headroom, in this case maintaining a threshold of the power headroom so there is a constant value associated to the headroom. Therefore the load indication will change the power headroom threshold so a certain headroom can be maintained.

As a first point, reverse link loading relates to a base station receiving signals on the uplink, and not to received signal interference being experienced on the downlink by a particular mobile station. It is therefore plain error for the Patent Office to suggest that Sintonen's interference signal, as seen by a specific mobile station with respect to a desired received

signal, is related to reverse link load at a base station. And it is erroneous to suggest that Sintonen changing the conversion headroom of its received signal ADC responsive to changing amounts of interference has anything to do with changing a mobile station's transmit power headroom threshold according to indications of changing reverse link load.

Further, the articulated reasoning provided by the Patent Office as to why it would have been obvious to one of ordinary skill in the art to combine Sintonen with Corazza is based directly on the erroneous assertion that Sintonen relates to adjusting a mobile station's transmit power headroom threshold. It does not. Sintonen does not relate to the reverse link, does not relate to adjusting reverse link data rates (Corazza), nor does it relate to adjusting the power headroom threshold used by a mobile station for transmitting on the reverse link (the claims).

Put simply, Sintonen teaches that the level of received signal interference changes dynamically, and that a mobile station can adjust the headroom in the ADC being used to digitize its received signal, to prevent signal clipping (paragraph [0030]), while still using as much of the ADC's conversion range as possible for the desired component of the received signal (paragraph [0031]).

The Rejection of claims 2, 3, 8, 9, 16, 19, and 20

Claims 2, 3, and 16 are rejected over Corazza, in combination with Sintonen, and in further view of Gopalakrishnann (U.S. Pub. 2002/0110101).

Claims 8, 9, 19, and 20 are rejected over Corazza, in combination with Sintonen, and in further view of Kakkakorpi (U.S. Pub. 2003/0179704).

Respective ones of these dependent claims depend from claim 1 or 14, and the addition of Gopalakrishnann does not provide the teachings missing from Corazza and Sintonen with respect to those independent claims. The rejection of these dependent claims fails for at least that reason

The Rejection of claims 24 and 25

Claims 24 and 25 are rejected as obvious over the combination of Corazza and Sintonen, in further view of Raaf (U.S. Pub. 2004/0029604).

Claim 24 is directed to a method of adjusting a (transmit) power headroom threshold in a mobile station. The claim includes the limitations of counting the number of times the mobile station is power limited for a retransmission of a frame, and adjusting a power headroom threshold of the mobile station based on the count. Similarly, claim 25 is directed to a mobile terminal comprising a transmitter for transmitting signals to the base station at a variable data transmission rate, a power outage counter for counting the number of times that the mobile station is power limited for a retransmission of a frame, and a controller to vary a power headroom threshold of the mobile station based on the count.

The rejection of these claims fails as a matter of law because the combination of references fails to teach or suggest adjusting the transmit power headroom threshold of a mobile station based on the number of times that a mobile station is power limited for retransmission of a frame. In particular, the rejection directly relies on the erroneous assertion that Sintonen teaches adjusting a mobile station's transmit power headroom threshold. Sintonen does not provide such teachings, as proven by the plain language of its disclosure. Nor does Raaf provide the missing teachings.

Raaf is relied on solely for its alleged teachings regarding counting preamble retransmissions at a maximum permissible power. Even that reliance is misplaced because counting the number of times a preamble is retransmitted at a maximum permissible power is not the same as the claim limitations at issue. Namely, in the claims, the count at issue is the number of times that the mobile station is power limited for retransmission of a frame—i.e., the number of times that the power needed for a retransmission exceeds the maximum transmit

power. Raaf, on the other hand, seems to count preamble retransmissions conducted at a maximum power, and not the number of times that it is power-limited.

Further, it is also notable that Raaf is explicitly directed to initiating closed-loop power control on a signal—see [0001]—for which Raaf teaches gradually ramping preamble transmission power upward toward an extreme value. This context and these operations are demonstrably unrelated to Corazza and Sintonen, and Raaf does not appear to combine with those references in any legally obvious manner.

Closing

Applicant appreciates the indication of allowable subject matter in claims 5, 6, 10-13, and 21-23. However, Applicant respectfully submits that all pending claims are allowable over the cited references, and therefore kindly asks for the examiner's careful reconsideration.

Respectfully submitted,

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